

USER'S MANUAL

Logimac 480VM_T

Up to 4 pumps PLC based control system with color touch screen operator interface

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SYSTEM PARAMETERS' DEFAULT SETTINGS

FUNCTION KEY	PLC REGISTER	PARAMETER	INITIAL VALUE	ADJUSTED VALUE	NOTES
Main Screen	225	Language French English	English		
PARAMETERS	102	New password	9		
PARAMETERS	23 24	Number of pumps in OPERATION: in PARAllel:	4 4		CHOICE: 1... 4 2 ...4
PARAMETERS	2	Start 1 delay	10 s		
PARAMETERS	5	Start 2 delay	10 s		
PARAMETERS	613	Start 3 delay	10 s		
PARAMETERS	616	Start 4 delay	10 s		
PARAMETERS	8	Blocking delay P1	15 s		
PARAMETERS	11	Blocking delay P2	15 s		
PARAMETERS	619	Blocking delay P3	15 s		
PARAMETERS	622	Blocking delay P4	15 s		
PARAMETERS	20	Alarm delay	5s		
PARAMETERS	132	Contactor Closing delay	10s		
PARAMETERS	70	minimum level for 4 mA	0 m		
PARAMETERS	72	maximum level for 20mA	5.00 m		
PARAMETERS	74	Start 1 level	1.00 m		
PARAMETERS	75	Start 2 level	1.20 m		
PARAMETERS	625	Start 3 level	1.40 m		
PARAMETERS	626	Start 4 level	1.60 m		
PARAMETERS	76	Stop 1 level	0.50 m		
PARAMETERS	77	Stop 2 level	0.50 m		
PARAMETERS	627	Stop 3 level	0.50 m		
PARAMETERS	628	Stop 4 level	0.50 m		
PARAMETERS	107 106	High level alarm Low level alarm	2.00 m 0 m		
PARAMETERS	96	P1 max. current	50 A		
PARAMETERS	98	P2 max. current	50 A		
PARAMETERS	629	P3 max. current	50 A		
PARAMETERS	631	P4 max. current	50 A		
PARAMETERS	111 701	P1 high current alarm Delay	35 A 30 s		
PARAMETERS	112 704	P2 high current alarm Delay	35 A 30 s		
PARAMETERS	633 713	P3 high current alarm Delay	35 A 30 s		
PARAMETERS	634 716	P4 high current alarm Delay	35 A 30 s		
PARAMETERS	100 707	P1 low current alarm Delay	0 A 30 s		
PARAMETERS	101 710	P2 low current alarm Delay	0 A 30 s		
PARAMETERS	635 719	P3 low current alarm Delay	0 A 30 s		
PARAMETERS	636 722	P4 low current alarm Delay	0 A 30 s		
PARAMETERS		Mode Choice	Alternate; all		Choice: Alternate all Alternate, P3SB Alternate, P4SB * Alternate, P2SB Alternate, P1SB No ALT, P1Lead No ALT, P2Lead No ALT, P3Lead No ALT, P4Lead*

* Available only if number of pumps in OPERATION is 4
SB -Stand-By

PLC READ-ONLY DATA REGISTER READING

FUNCTION KEY of OPERATOR INTERFACE	PLC REGISTER	PARAMETER	READINGS						
			1	2	3	4	5	6	7
Operational Data	146, 143	Runtime P1 total							
Operational Data	176, 173	Runtime P1/day							
Operational Data	155, 152	Runtime P2 total							
Operational Data	185, 182	Runtime P2/day							
Operational Data	542, 539	Runtime P3 total							
Operational Data	578, 575	Runtime P3/day							
Operational Data	551, 548	Runtime P4 total							
Operational Data	587, 584	Runtime P4/day							
Operational Data	164, 161	2P Runtime total							
Operational Data	194, 191	2P Runtime/day							
Operational Data	560, 557	3P Runtime total							
Operational Data	596, 593	3P Runtime/day							
Operational Data	569, 566	4P Runtime total							
Operational Data	605, 602	4P Runtime/day							
Operational Data	217, 214	Overflow runtime							
Operational Data	202	No. of starts P1							
Operational Data	205	No. of starts P2							
Operational Data	608	No. of starts P3							
Operational Data	645	No. of starts P4							
Operational Data	208	Hi level occurrences							
Operational Data	220	Overflow occurrences							

INTRODUCTION

The **LOGIMAC® 480VM_T P/N 13-50 90 96** was designed for the control and supervision of a sewage pumping station with up to four pumps.

The complete system consists of programmable logic controller **LOGIMAC® 480VM_T-PLC** as per the configuration specified in the following chapter, the operator interface **LOGIMAC® 480VM_T-OP**.

A level sensor with 4-20 mA output signal provides the **LOGIMAC® 480VM_T-PLC** with the level data for pump control.

1.1 Approvals

Sensor: CSA certified for operation in **Class I, Division 2, Groups C and D hazardous environments**.

(Note: For this approval to be valid special installation conditions apply).

1.2 Part numbers

LOGIMAC® 480VM_T-PLC (P/N 13-50 90 97); program L480VM_T

ANALOG Expansion unit (P/N 13-40 02 30)

Cable RS-232 (P/N 13-40 02 19)

LOGIMAC® 480VM_T-OP (P/N 13-50 90 98); program L480VM_T.cpa

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2. HARDWARE DESCRIPTION

2.1 LOGIMAC® 480VM_T-PLC CONFIGURATION

The programmable logic controller (PLC) is composed of the modules specified in the table below

CONFIGURATION of **LOGIMAC® 480VM_T-PLC**:

ITEM #	DESCRIPTION	TECHNICAL DATA
P/N 13-50 90 97	CPU & Memory	Flash user memory program memory: 24 Kwords storage memory: 32 Kwords operation speed: 1.0 ms/ 1Kword of logic user program: L480VM_T
	40 - inputs	24V DC; curent consomption: 7.3mA max./point
	24 relays outputs	Operating voltage: 5-30 V DC 5-250 V AC max. load: 2A resistive/ 0.6A inductive
	Supply	120V AC (102 -132V), 60 Hz (47- 63 Hz) DC output power supply: 24V + -10%, 435 mA max. current
	Dimensions	(90H x 190W x76D) mm
	service temperature	0..+55 °C
	stocking temperature	-40..+85 °C
	Port	Two serial ports: 1: RS 232, 2: RS 232 (BY DEFAULT) Optional port 2: RS485, Ethernet, USB
	Removable terminal strip	included
2 x P/N 13-40 02 30	2 x Analogue Expansion unit 2 x (4-inputs/2-outputs)	<u>Inputs: current 4-20mA</u> <u>outputs: current 4-20mA</u> Supply : 120V AC (102 -132V), 60 Hz (47- 63 Hz) Dimensions: 90H x 95W x76D) mm

2.2 OPERATOR INTERFACE LOGIMAC® 480VM T-OP

The operator interface LOGIMAC® 480VM_T-OP is a fully programmable man-machine interface. One part of a programming can be done using the software, specific for the unit, and another one should be programmed in the PLC program software for PLC ladder programming.

The operator interface is equipped of:

- 6.5" Touch screen graphic display 640x480 pixels
- Real-time clock
- Application memory 12MB
- 10/100Mbit/s Ethernet port (RJ45)
- PLC communication port RS 232
- RS422/RS485 serial port
- USB Host & USB device ports
- cable: operator interface-PLC (DB9F- RG45)
- The supply voltage 24VDC (20-30V)
- Power consumption: Normal 0.4A @ 24VDC, Max 0.9A
- Dimensions: (219 x 154 x 6)mm mounting depth 55 mm
- Operation temperature 0-+50degC
- Storage temperature -20 to+70degC

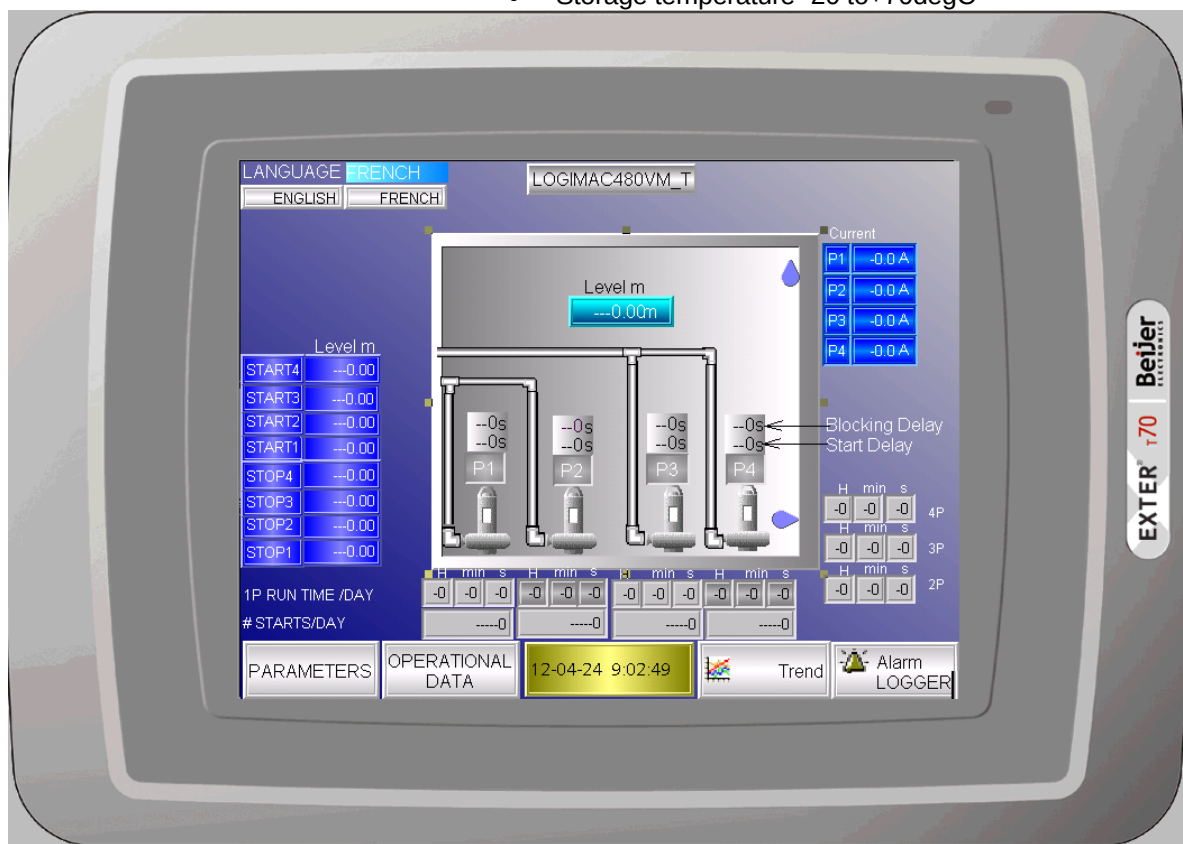


FIG.1 Operator interface unit LOGIMAC 480VM_T-OP

The operator interface was fully programmed for this application (see description of this programming in chapter 5 of this manual).

For further details, please refer to the manufacturer user manual supplied with unit.

3. LOGIMAC® 480VM_T-PLC INPUT & OUTPUT CONNECTION

LOGIMAC® 480VM_T-PLC has 40 digital inputs, 24 digital relay-based outputs and 8 analog 4-20 mA inputs. For this application the inputs and outputs are assigned to the signals specified in the table 1, 2 and 3 respectively.

TABLE 1.: DIGITAL INPUT ASSIGNATION

a) 40- inputs

INPUT	DESCRIPTION	NOTES
1	ACKNOWLEDGE/ RESET	signal provided by push button "ACKNOWLEDGE/ RESET on the alarm annunciator
2	M1 contactor closed	auxiliary contact of the M1 contactor to indicate the contactor status
3	M2 contactor closed	auxiliary contact of the M2 contactor to indicate the contactor status
4	B1 (OL1)	contact indicating overload of the P1 pump or breaker open (breaker auxiliary contact)
5	R6 leakage P1	interface relay contact from Mini CAS II unit indicating a water leakage in P1 pump
6	R5 high temp. P1	interface relay contact from Mini CAS II unit indicating a high temperature in P1 pump
7	B2 (OL2)	contact indicating overload of the P2 pump or breaker open(breaker auxiliary contact)
8	R8 leakage P2	interface relay contact from Mini CAS II unit indicating a water leakage in P2 pump
9	R7 high temp.P2	interface relay contact from Mini CAS II unit indicating a high temperature in P2 pump
10	FLH (ISRH)	interface relay contact indicating the high level reached (follows FL.H float NO contact)
11	Overflow (optional)	Contact indicating the overflow level reached.
12	PFD	voltage or phase failure detection (PFD)
13	Genset run	Contact to limit the number of pumps allowed in parallel operation
14	spare	
15	spare	
16	FLL(ISRL)	Contact indicating the low level reached (follows FLL float NC contact)

For wiring details see project drawing

INPUT	DESCRIPTION	NOTES
17	M3 contactor closed	auxiliary contact of the M3 contactor to indicate the contactor status
18	M4 contactor closed	auxiliary contact of the M4 contactor to indicate the contactor status
19	B3 (OL3)	contact indicating overload of the P3 pump or breaker open (breaker auxiliary contact)
20	R10 leakage. P3	interface relay contact from Mini CAS II unit indicating a water leakage in P3 pump
21	R9 high temp. P3	interface relay contact from Mini CAS II unit indicating a high temperature in P3 pump
22	B4 (OL4)	contact indicating overload of the P4 pump or breaker open (breaker auxiliary contact)
23	R12 leakage P4	interface relay contact from Mini CAS II unit indicating a water leakage in P4 pump
24	R11 high temp.P4	interface relay contact from Mini CAS II unit indicating a high temperature in P4 pump
25-36	Spare	Future usage
37	P1 AUTO	Pump 1 operation mode selector in AUTO position mode automatic
38	P2 AUTO	Pump 2 operation mode selector in AUTO position mode automatic
39	P3 AUTO	Pump 3 operation mode selector in AUTO position mode automatic
40	P4 AUTO	Pump 4 operation mode selector in AUTO position mode automatic

For wiring details see project drawing.

TABLE 2.: DIGITAL OUTPUT ASSIGNATION

a) 24-output

OUTPUT	DESCRIPTION	NOTES
1	PLC OK	PLC operational status (active if PLC OK)
2	M1 closing signal	order to close the M1 contactor (interface relay R1)
3	M2 closing signal	order to close the M2 contactor (interface relay R2)
4	COMMON alarm	Common alarm signal for remote transmission (interface relay R14)
5-6	Spare	
7	High Level Alarm	High Level alarm coming from FLH float. It is maintained, RESET required.
8	Low Level Alarm	Low Level alarm coming from FLL float. It is maintained, RESET required.
9	P1 Failure Alarm	Includes: Overload, high temperature, leakage, high or low current, contactor closing fault for pump P1
10	P2 Failure Alarm	Includes: Overload, high temperature, leakage, high or low current, contactor closing fault for pump P2
11	P3 Failure Alarm	Includes: Overload, high temperature, leakage, high or low current, contactor closing fault for pump P3
12	P4 Failure Alarm	Includes: Overload, high temperature, leakage, high or low current, contactor closing fault for pump P4
13-16	Spare	
17	M3 closing signal	order to close the M3 contactor (interface relay R3)
18	M4 closing signal	order to close the M4 contactor (interface relay R4)
19-24	Spare	

For wiring details see project drawing

TABLE 3 ANALOG INPUT ASSIGNATION

INPUT	DESCRIPTION	Notes
1	Level signal	Level signal from a 4-20 mA sensor. Use the operator interface for scaling
2	P1 current signal (optional)	P1 pump current signal 4-20mA from current transducer. Use the operator interface for scaling
3	P2 current signal (optional)	P2 pump current signal 4-20mA from current transducer. Use the operator interface for scaling
4	P3 current signal (optional)	P3 pump current signal 4-20mA from current transducer. Use the operator interface for scaling
5	P4 current signal (optional)	P4 pump current signal 4-20mA from current transducer. Use the operator interface for scaling
6	Flow signal from Flowmeter (optional)	Inflow signal 4-20mA from Flowmeter. Use the operator interface for scaling
7	spare	4-20mA signal Future application
8	spare	4-20mA signal Future application

For wiring details see project drawing

TABLE 4 ANALOG OUTPUT ASSIGNATIONS

OUTPUT	DESCRIPTION	Notes
1	SPARE	4-20mA signal Future application
2	SPARE	4-20mA signal Future application
3	SPARE	4-20mA signal Future application
4	SPARE	4-20mA signal Future application

4. PLC PROGRAM DESCRIPTION

4.1 INITIAL PARAMETERS WRITING

During the first scan or coldstart of the program the initial default parameters are automatically written to the assigned memory registers. TABLE 4 presents the list of the parameters and their default values.

An operator can read or change (write) these parameters using operator interface function keys listed in the first column of the table (see 5.2 chapter for details).

TABLE 4: SYSTEM PARAMETERS' DEFAULT SETTINGS

FUNCTION KEY 1	FUNCTION KEY 2	PLC REGISTER	PARAMETER	INITIAL VALUE	NOTES
Main Screen	-	225	Language F - French E - English	E - English	
PARAMETERS	PASS change	102	New password	9	
PARAMETERS	DELAYS Settings	2	Start 1 delay	10 s	
PARAMETERS	DELAYS Settings	5	Start 2 delay	10 s	
PARAMETERS	DELAYS Settings	613	Start 3 delay	10 s	
PARAMETERS	DELAYS Settings	616	Start 4 delay	10 s	
PARAMETERS	DELAYS Settings	8	Blocking delay P1	15 s	
PARAMETERS	DELAYS Settings	11	Blocking delay P2	15 s	
PARAMETERS	DELAYS Settings	619	Blocking delay P3	15 s	
PARAMETERS	DELAYS Settings	622	Blocking delay P4	15 s	
PARAMETERS	DELAYS Settings	20	Alarm delay	5s	
PARAMETERS	DELAYS Settings	132	Contactor Closing delay	10s	
PARAMETERS	LEVEL Scaling	70	minimum level for 4 mA	0 m	
PARAMETERS	LEVEL Scaling	72	maximum level for 20mA	5.00 m	
PARAMETERS	LEVELS Setting	74	Start 1 level	1.00 m	
PARAMETERS	LEVELS Setting	75	Start 2 level	1.20 m	
PARAMETERS	LEVELS Setting	625	Start 3 level	1.40 m	
PARAMETERS	LEVELS Setting	626	Start 4 level	1.60 m	
PARAMETERS	LEVELS Setting	76	Stop 1 level	0.50 m	
PARAMETERS	LEVELS Setting	77	Stop 2 level	0.50 m	
PARAMETERS	LEVELS Setting	627	Stop 3 level	0.50 m	
PARAMETERS	LEVELS Setting	628	Stop 4 level	0.50 m	
PARAMETERS	LEVELS Setting	107	High level alarm	2.00 m	
		106	Low level alarm	0 m	
PARAMETERS	CURRENT Scaling	96	P1 max. current	50 A	
PARAMETERS	CURRENT Scaling	98	P2 max. current	50 A	
PARAMETERS	CURRENT Scaling	629	P3 max. current	50 A	
PARAMETERS	CURRENT Scaling	631	P4 max. current	50 A	
PARAMETERS	CURRENTS Settings	111	P1 high current alarm	35 A	
		701	Delay	30 s	
PARAMETERS	CURRENTS Settings	112	P2 high current alarm	35 A	
		704	Delay	30 s	
PARAMETERS	CURRENTS Settings	633	P3 high current alarm	35 A	
		713	Delay	30 s	
PARAMETERS	CURRENTS Settings	634	P4 high current alarm	35 A	
		716	Delay	30 s	
PARAMETERS	CURRENTS Settings	100	P1 low current alarm	0 A	
		707	Delay	30 s	
PARAMETERS	CURRENTS Settings	101	P2 low current alarm	0 A	
		710	Delay	30 s	
PARAMETERS	CURRENTS Settings	635	P3 low current alarm	0 A	
		719	Delay	30 s	
PARAMETERS	CURRENTS Settings	636	P4 low current alarm	0 A	
		722	Delay	30 s	
PARAMETERS	Mode of operation	23	Number of pump in OPERATION:	4	Choice: 1..4
		24	in PARALLEL:	4	2..4
		2000	Number of pumps:	0	0..1
		2001	Jockey Normal Storm	4	2..4

		2002	Standby pump choice !!All pumps have to be Normal!!	0	0..1
		1803		Alternate all	Alternate all Alternate, P3SB Alternate, P4SB * Alternate, P2SB Alternate, P1SB
		1800	Lead pump choice		No ALT, P1Lead No ALT, P2Lead No ALT, P3Lead No ALT, P4Lead*

* Available only if number of pumps in OPERATION is 4
SB -Stand-By

4.2 ANALOG INPUT READING & SCALING

All analog inputs are based on 12-bit analog-digital converter. During each scan of program 12 bits are converted in 16-bit analog data word %AI. Factory scaling for analog inputs of 4-20 mA and the corresponding level and the pump current scaling for the default ranges are provided on fig.2 and 3.

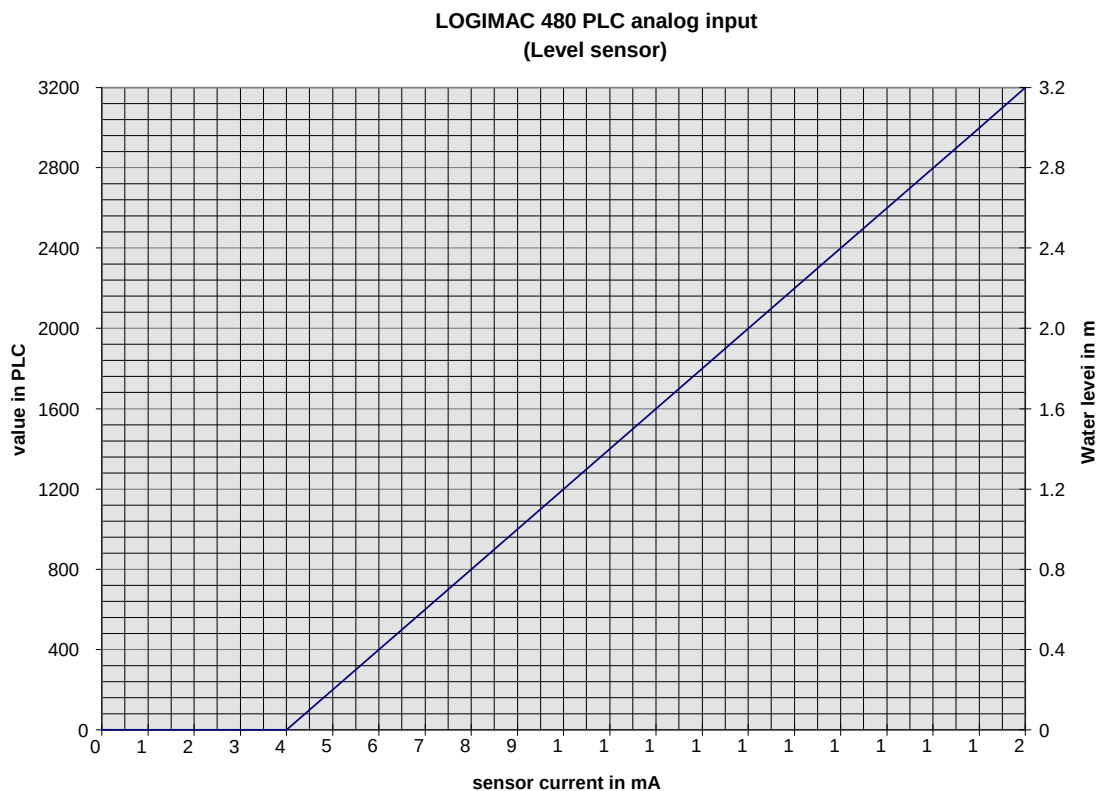


FIG. 2 ANALOG INPUT SCALING (LEVEL)

The scaling will be automatically changed by PLC if an operator provides different values of ranges using the operator interface. Example for the range 0-5m

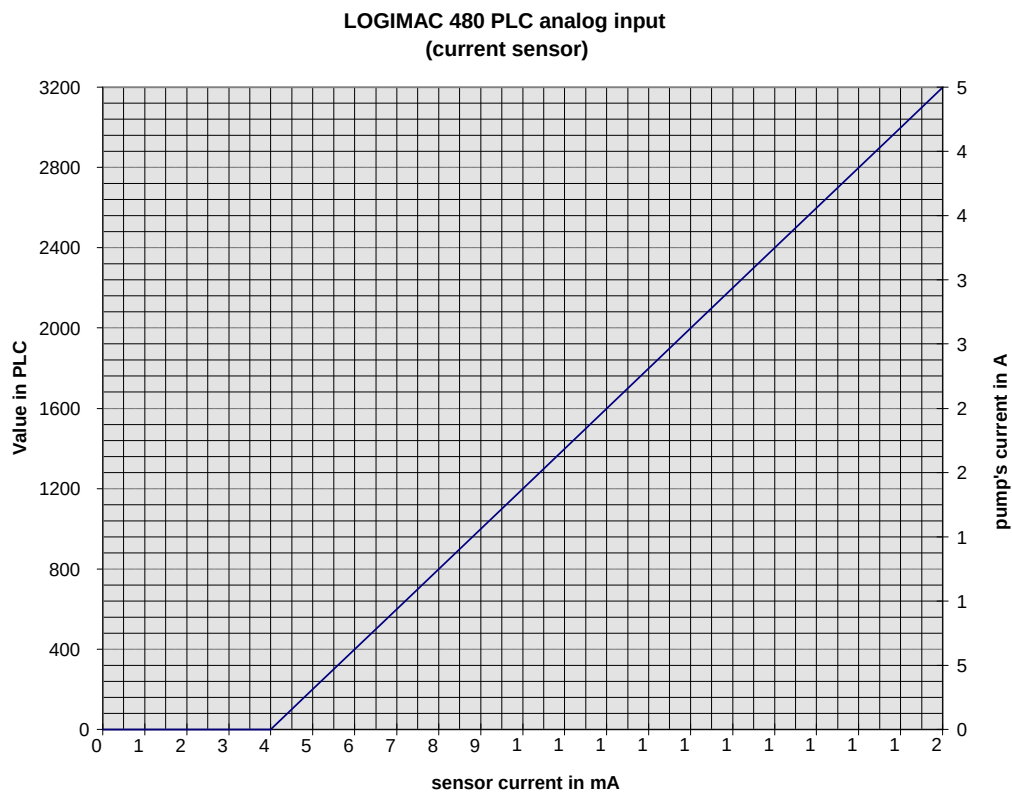
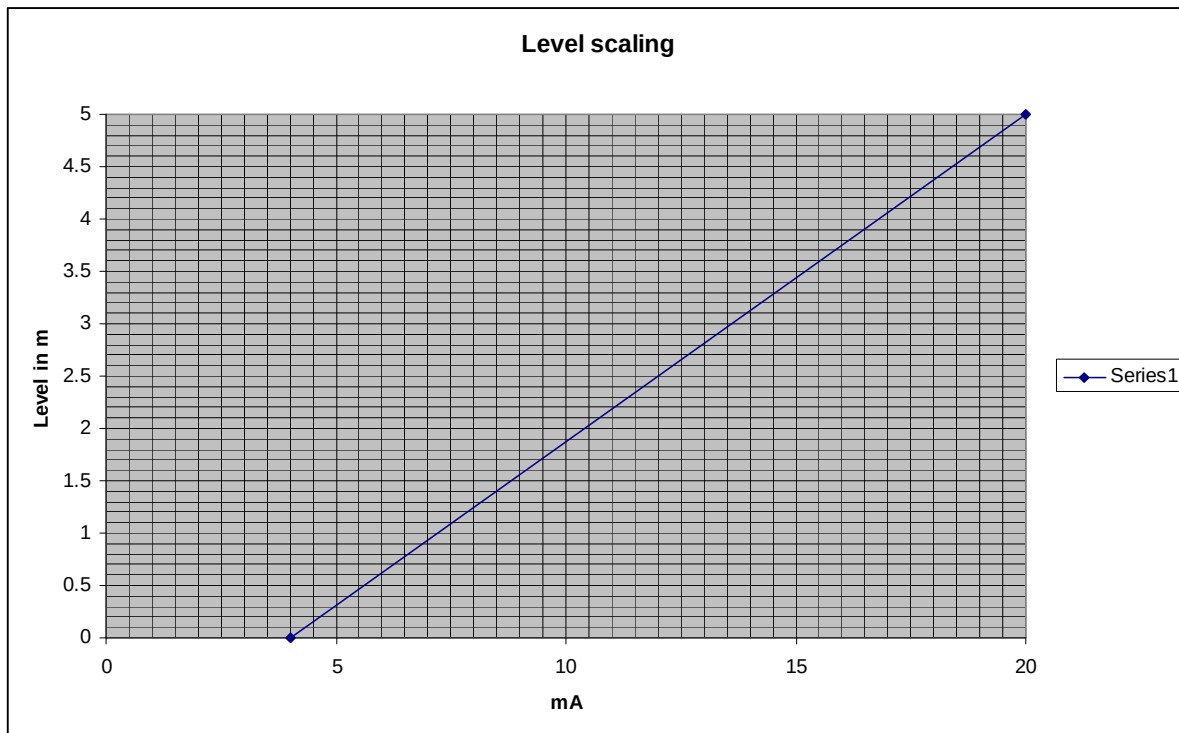


FIG.3 ANALOG INPUT SCALING(CURRENT)

If the inputs of pumps' currents are not used, no changes are required in default values of ranges. The PLC will treat these inputs as a zero signal.

4.3 STARTING PUMP CHOICE

The control system allows the operation of up to four pumps in parallel (operator choice) but prevents simultaneous start of two or more pumps.

The pumps operation depends on pump group setting.

Maximum 3 different groups can be chosen: group **N**-Normal, group **J**-Jockey, group **S**- Storm

N - Normal (minimum 2) these pumps will work in normal and high level condition. They can work together if the number of pumps in **Parallel** is set > 1.

J - Jockey: if **J=1**, **P1** will be called a jockey-pump. Usually this pump will be smaller than **Normal** pumps. This pump will always start first. Its purpose is to pump during a low inflow. Once the inflow rises above the jockey pump capacity and the second start level reaches, the normal pump will start and the jockey pump will stop. If **J=2**, **P1 & P2** will be the jockey pumps. **P1 & P2** will alternate but never run together.

S - Storm - usually pump larger than **Normal** pumps, designed to work only in case of an extreme high inflow (storm). If **S=1** **P4** is storm pump. If **S=2** then **P3 & P4** are the storm pumps. The storm pumps can alternate or not. They also can work together and with normal pumps depending on setting of **P**-number of pumps in parallel operation.

See table below for setting the desired operation

N	J	S	P	Operation description
4	0	0	4	All 4 pumps alternate; All 4 pumps can work together (in parallel)
4	0	0	3	All 4 pumps alternate; Only 3 pumps can work together (in parallel)
4	0	0	2	All 4 pumps alternate; Only 2 pumps can work together (in parallel)
4	0	0	1	All 4 pumps alternate; Only 1 pump can run at the time (no parallel operation)
3	0	0	3	All 3 pumps alternate; All 3 pumps can work together (in parallel)
3	0	0	2	All 3 pumps alternate; Only 2 pumps can work together (in parallel)
3	0	0	1	All 3 pumps alternate; Only 1 pump can run at the time (no parallel operation)
3	1	0	3	P1-jockey pump always starts first. P2,P3, P4 alternate and all can work together (in parallel). P1 stops if the first of the normal pumps starts.
3	1	0	2	P1-jockey pump always starts first. P2,P3, P4 alternate and 2 of them can work together (in parallel). P1 stops if the first of the normal pumps starts.
3	1	0	1	P1-jockey pump always starts first (START 1). P2,P3, P4 alternate but only one of the can run at the time (no parallel operation). P1 stops if the normal pump starts.
2	1	0	2	P1-jockey pump always starts first. P2,P3 alternate and both can work together (in parallel). P1 stops if the first of the normal pumps starts.
2	1	0	1	P1-jockey pump always starts first. P2, P3 alternate but only one of them can run at the time (no parallel operation). P1 stops if the normal pump starts.
2	2	0	2	P1, P2-jockey pumps; one of them (P1/P2) always starts first (START 1); They alternate but never work in parallel. P3,P4 alternate and both can work together (in parallel). P1/P2 stops if the first of the normal pumps starts (on START 2).
2	2	0	1	P1, P2-jockey pumps; one of them (P1/P2) always starts first (START 1) They alternate but never work in parallel. P3, P4 alternate but only one of them can run at the time (no parallel operation). P1/P2 stops if the normal pump starts (on START 2).
3	0	1	4	P1, P2, P3, normal pumps. They alternate. P4-storm pump All 4 pumps can work together (in parallel)
3	0	1	3	P1, P2, P3 - normal pumps. They alternate. P4-storm pump. Only 3 normal pumps can work together (in parallel). Normal pumps stop

				if P4 starts (START 4).
N	J	S	P	Operation description
3	0	1	2	P1, P2, P3, normal pumps. They alternate. P4-storm pump. Only 2 normal pumps can work together (in parallel). Normal pumps stop if P4 starts (START3).
3	0	1	1	P1, P2, P3, normal pumps. They alternate. P4-storm pump. Only 1 normal pump can run at the time (no parallel operation). Normal pump stops if P4 starts (START 2).
2	0	1	3	P1, P2 normal pumps. They alternate. P3-storm pump All 3 pumps can work together (in parallel)
2	0	1	2	P1, P2 normal pumps. They alternate. P3-storm pump Only 2 normal pump can work together (in parallel). Normal pumps stop if P3 starts (START 3).
2	0	1	1	P1, P2 normal pumps. They alternate. P3-storm pump Only 1 normal pumps can run at the time (no parallel operation)). Normal pump stops if P3 starts (START 2).
2	0	2	4	P1, P2 - normal pumps. P3, P4-storm pumps. The pumps alternate within their group. All 4 pumps can work together (in parallel)
2	0	2	3	P1, P2 - normal pumps. P3, P4-storm pumps. The pumps alternate within their group. Only 3 pumps can work together (in parallel: 2 normal + 1storm)
2	0	2	2	P1, P2 - normal pumps. P3, P4-storm pumps. The pumps alternate within their group. 2 normal or 2 storm pumps can work together (in parallel). Normal pumps stop if the first of storm pumps starts (START3).
2	0	2	1	P1, P2 - normal pumps. They alternate but only 1 normal pump can run at the time (no parallel operation). P3, P4-storm pumps. Normal pump stops if the first of storm pumps starts (START 2).
2	1	1	3	P1-jockey pump always starts first. P1 stops if the normal pump starts. P2, P3, normal pumps. They alternate. P4-storm pump. All normal and storm pumps (3) can work together (in parallel).
2	1	1	2	P1-jockey pump always starts first. P1 stops if the normal pump starts. P2, P3, normal pumps. They alternate. P4-storm pump. Only 2 normal pumps can work together (in parallel). Normal pumps stop if P4 starts (START4).
2	1	1	1	P1-jockey pump always starts first. P1 stops if the normal pump starts. P2, P3, normal pumps. They alternate. P4-storm pump. Only 1 normal pump can run at the time (no parallel operation). Normal pump stop if P4 starts (START3).

Note: Total number of pumps **N+J+S** can't be higher than 4. The system will reset to default setting (N=4,J=0, S=0, P=4) if during a setup the total 4 is exceeded.

If all pumps available are set as **Normal** the additional mode settings of **STANDBY PUMP** or **LEADING PUMP** is available

The pumps' starting sequence depend on:

- the number of pumps in **OPERation**,
- the number of pumps allowed to run in **PARAllel**
- the operation mode setting : (Alternate all; Alternate &P4SB ; Alternate &P3SB, Alternate &P2SB; Alternate &P1SB; No Alternate &P1Lead; No Alternate &P2Lead; No Alternate &P3Lead; No Alternate &P4Lead.)

For the given setting the pumps will operate as shown in the table below

OPERation	PARAllel	MODE	Operation description
3	3	Alternate all	All pumps alternate in sequences 1,2,3: 1: P1-P2-P3; 2: P2-P3-P1; 3: P3-P1-P2
3	2	Alternate all	All pumps alternate in sequences 1,2,3: 1: P1-P2; 2: P2-P3; 3: P3-P1

3	2	Alternate &P3SB,	2 pumps alternate in sequences 1,2: 1: P1-P2; 2: P2-P1; P3 starts only if P1 or P2 is out of order
3	2	Alternate &P2SB,	2 pumps alternate in sequences 1,3: 1: P1-P3; 2: P3-P1; P2 starts only if P1 or P3 is out of order
3	2	Alternate &P1SB,	2 pumps alternate in sequences 2,3: 1: P2-P3; 2: P3-P2; P1 starts only if P2 or P3 is out of order
4 DEFAULT	4 DEFAUL T	Alternate all DEFAULT	All pumps alternate in sequences 1,2,3,4: 1: P1-P2-P3-P4; 2: P2-P3-P4-P1; 3: P3-P4-P1-P2; 4: P4-P1-P2-P1
4	3	Alternate all	All pumps alternate in sequences 1,2,3,4: 1: P1-P2-P3; 2: P2-P3-P4; 3: P3-P4-P1; 4: P4-P1-P2
4	2	Alternate all	All pumps alternate in sequences 1,2,3,4: 1: P1-P2; 2: P2-P3; 3: P3-P4; 4: P4-P1
4	3	Alternate &P4SB,	3 pumps alternate in sequences 1,2,3: 1: P1-P2-P3; 2: P2-P3-P1; 3: P3-P1-P2; P4 starts only if P1or P2 or P3 is out of order
4	2	Alternate &P4SB,	3 pumps alternate in sequences 1,2,3: 1: P1-P2; 2: P2-P3; 3: P3-P1; P4 starts only if P1or P2 or P3 is out of order
4	3	Alternate &P3SB,	3 pumps alternate in sequences 1,2,4: 1: P1-P2-P4; 2: P2-P4-P1; 4: P4-P1-P2; P3 starts only if P1or P2 or P4 is out of order
4	2	Alternate &P3SB,	3 pumps alternate in sequences 1,2,4: 1: P1-P2; 2: P2-P4; 4: P4-P1; P3 starts only if P1or P2 or P4 is out of order
4	3	Alternate &P2SB,	3 pumps alternate in sequences 1,3,4: 1: P1-P3-P4; 3: P3-P4-P1; 4: P4-P1-P3; P2 starts only if P1or P3 or P4 is out of order
4	2	Alternate &P2SB,	3 pumps alternate in sequences 1,3,4: 1: P1-P3; 3: P3-P4; 4: P4-P1; P2 starts only if P1or P3 or P4 is out of order
4	3	Alternate &P1SB,	3 pumps alternate in sequences 2,3,4: 2: P2-P3-P4; 3: P3-P4-P2; 4: P4-P2-P3; P1 starts only if P4or P2 or P3 is out of order
4	2	Alternate &P1SB,	3 pumps alternate in sequences 2,3,4: 2: P2-P3; 3: P3-P4; 4: P4-P2; P1 starts only if P4or P2 or P3 is out of order
3	3	No Alternate P1LEAD	ALWAYS THE SAME SEQUENCE 1: P1 -P2-P3
3	2	No Alternate P1LEAD	ALWAYS THE SAME SEQUENCE 1: P1 -P2; P3 starts only if P1 or P2 is out of order
3	3	No Alternate P2LEAD	ALWAYS THE SAME SEQUENCE 2: P2 -P3-P1
3	2	No Alternate P2LEAD	ALWAYS THE SAME SEQUENCE 2: P2 -P3; P1 starts only if P2 or P3 is out of order
3	3	No Alternate P3LEAD	ALWAYS THE SAME SEQUENCE 3: P3 -P1-P2
3	2	No Alternate P3LEAD	ALWAYS THE SAME SEQUENCE 3: P3 -P1; P2 starts only if P1 or P3 is out of order

4	4	No Alternate P1LEAD	ALWAYS THE SAME SEQUENCE 1: P1-P2-P3-P4
4	3	No Alternate P1LEAD	ALWAYS THE SAME SEQUENCE 1: P1-P2-P3 P4 starts only if P1 or P2 or P3 is out of order
4	2	No Alternate P1LEAD	ALWAYS THE SAME SEQUENCE 1: P1-P2; P3 starts only if P1 or P2 is out of order P4 starts only if two pumps are out of order
4	4	No Alternate P2LEAD	ALWAYS THE SAME SEQUENCE 2: P2-P3-P4
4	3	No Alternate P2LEAD	ALWAYS THE SAME SEQUENCE 2: P2-P3-P4 P1 starts only if P4 or P2 or P3 is out of order
4	2	No Alternate P2LEAD	ALWAYS THE SAME SEQUENCE 2: P2-P3; P4 starts only if P3 or P2 is out of order P1 starts only if two pumps are out of order
4	4	No Alternate P3LEAD	ALWAYS THE SAME SEQUENCE 3: P3-P4-P1-P2
4	3	No Alternate P3LEAD	ALWAYS THE SAME SEQUENCE 3: P3-P4-P1 P2 starts only if P1 or P4 or P3 is out of order
4	2	No Alternate P3LEAD	ALWAYS THE SAME SEQUENCE 3: P3-P4; P1 starts only if P3 or P4 is out of order P2 starts only if two pumps are out of order
4	4	No Alternate P4LEAD	ALWAYS THE SAME SEQUENCE 4: P4-P1-P2-P3
4	3	No Alternate P4LEAD	ALWAYS THE SAME SEQUENCE 4: P4-P1-P2 P2 starts only if P1 or P4 or P3 is out of order
4	2	No Alternate P4LEAD	ALWAYS THE SAME SEQUENCE 4: P4-P1; P2 starts only if P1 or P4 is out of order P3 starts only if two pumps are out of order

The default settings are: # of pumps in **OPERation**: **4**, # pumps are allowed to run in **PARAllel**: **4**; MODE Alternate.

All settings are password protected

In automatic mode the choice of the pump start sequence is done automatically following the previous cycle of operation memorized conditions.

If no sequence is memorized or if no alternate mode is chosen the pumps will start following the SEQUENCE 1(P1, P2, P3, P4).

On the event of the pump failure, the pump next in sequence, will receive the order to start with respect to level conditions and the number of pumps allowed in parallel operation.

To start the pump, either the start conditions should be kept during at least **10-second** period calling **START DELAY**. The default value of 10 seconds can be changed by operator (see **TIME DELAY CHANGE** in chapter 5.2)

If one of the pumps is stopped (for whatever reason) the **BLOCKING DELAY** will be activated. None of the pumps can start during this period (all pumps will be prevented to start). If more pumps are running and one of them stops, this delay will not have effect on the running pumps.

The default value of the **BLOCKING DELAY** are 15 s and can be adjusted by operator using operator interface for each pump separately (see *TIME DELAY CHANGE* in chapter 5.2).

4.4 CONTACTOR OPERATION

In automatic mode the pump contactor (M1, M2, M3, M4) will close following the closing signal from corresponding interface relay (R1, R2, R3 or R4) after **START DELAY** as specified in previous chapter. The reception of the contactor closing confirmation by PLC will be indicated by turning on the respective PUMP **P1**, PUMP **P2**, PUMP **P3** or PUMP **P4** on the Main Screen

NOTE: Closing fault: If PLC does not receive a confirmation of the contactor closing (see M1, M2, M3, M4 contacts connected to PLC inputs) during the 10-second period following the closing order (R1, R2, R3 or R4 relay contact closing), the closing order will be removed and the alarm will be signaled.

In automatic mode, if stop conditions are reached (STOP 1, 2 , 3, 4 levels) and are held during the STOP DELAY, the contactors will open following the reversed start sequence (the rule LIFO : **Last In First Out**).

Each contactor can be opened or closed manually, using a mode selector MAN-OFF-AUTO (**MAN-OFF** positions).

Either during manual or automatic operation the contactor opens automatically on fault conditions of the respective pump.

4.5 ALARMS : Memorizing, indication, acknowledge, reset.

The following alarms can be stored in the operator interface memory:

Pumps` alarms for each pump:

- Overload
- Contactor closing fault
- Leakage
- High temperature
- Low current
- High current
- No automatic mode (warning)

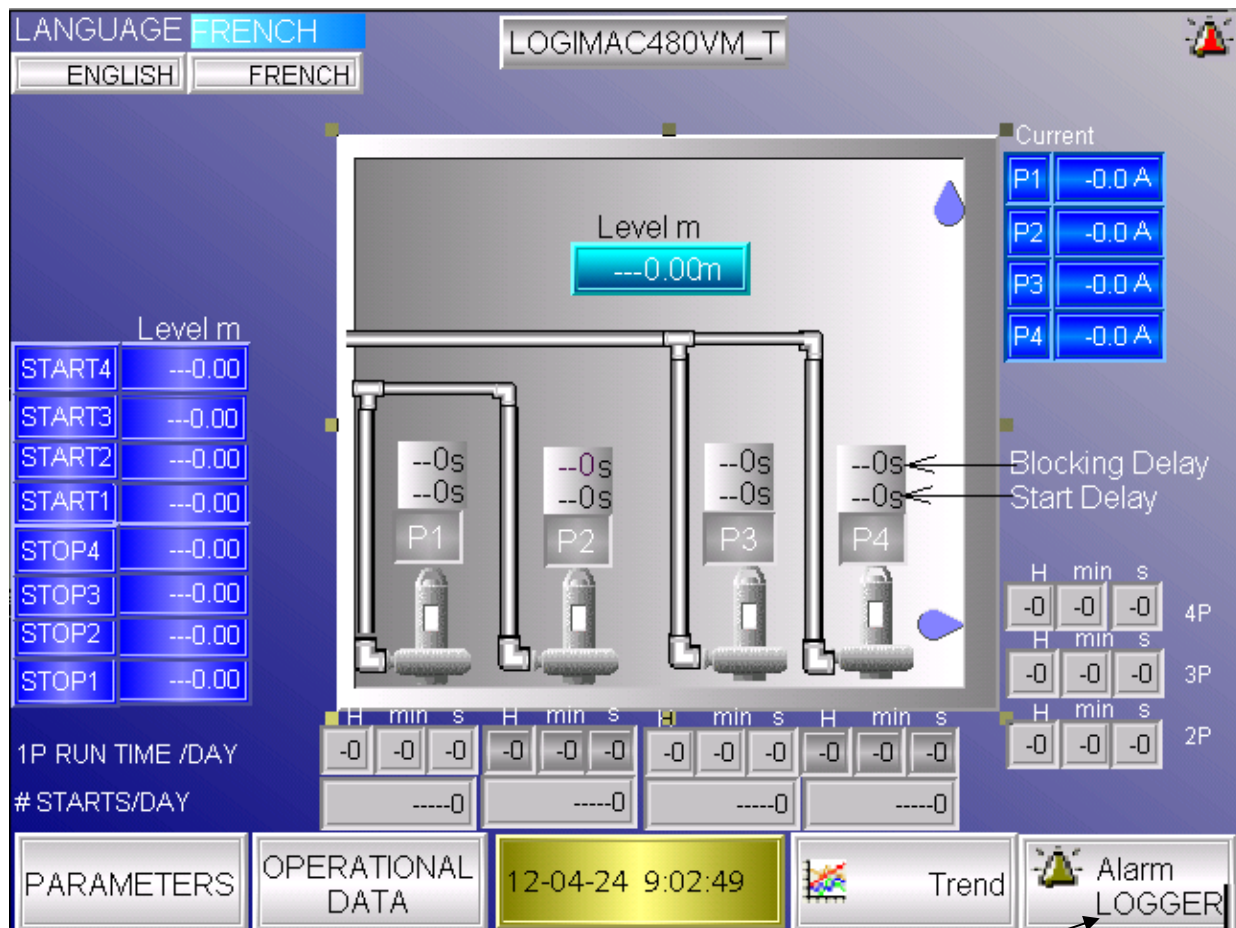
Well alarms:

- High Level
- Low Level
- Overflow

Supply alarm

- Power failure

If any alarm is active alarm BEL  will appear on the high right corner of the Main Screen



Touch Alarm LOGGER to go to the alarm page

ALARM PAGE



Prefix Legend:

(1) - Number of alarm's occurrences before acknowledge

* - Active alarm, no acknowledged

\$ - Alarm no active, unacknowledged

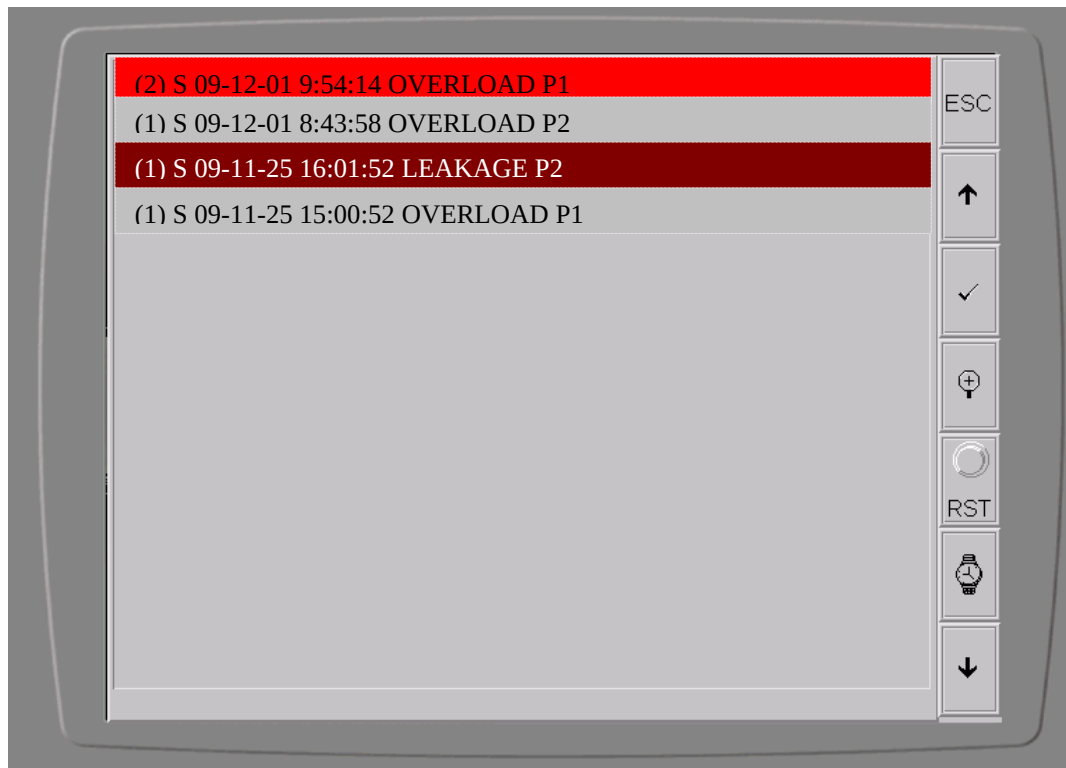
- - Active alarm, but acknowledged

Void- alarms no active & acknowledged

For alarm acknowledge in operator interface, touch the alarm description first, then the button with check mark.

For alarm acknowledge/RESET in PLC, correct the fault first and then touch the RST button (once for acknowledge and twice for RESET). Using the RESET P.B connected to the input 1 of the PLC will do the same job.

To see the time of the alarm occurrences and acknowledge touch the button with clock 



By touching consecutively the button with clock , you can see different times with prefix **S, E, A**
Where:

- S** - Time of alarm activation
- E** - Time of alarm disappearance
- A** - Time of alarm acknowledge

4.5.1 P1 / P2 / P3 / P4 PUMP OVERLOAD

On the overload fault, the respective pump breaker opens. Auxiliary contacts of breakers are used as the overload signal for PLC inputs (B1, B2, B3 or B4).

If one of contacts is closed, the corresponding contactor closing signal will be removed (see R1, R2, R3, R4 relay) and the OVERLOAD alarm will be memorized in PLC and operator interface memories.

This alarm will be held, even if the fault conditions disappear. The contactor of the pump in fault will open automatically and cannot be closed without an operator's intervention.

Reset the circuit after the fault correction: push the RESET push-button (Alarm Page) once for **acknowledge**, and twice for **reset**.

4.5.2. M1/M2/M3/M4 contactor CLOSING FAULT

If the PLC does not receive the confirmation of the contactor closing (see M1 or M2 contact as PLC inputs) during the 10-second period following the closing order (R1 or R2 relay contact closing), the closing order will be removed and the alarm M1/M2 contactor closing fault will be registered in PLC and operator interface memories.

This alarm will be held, even if the fault conditions disappear.

Reset the circuit after the fault correction: push the RESET push-button once for **acknowledge** and twice for **reset**, or use RST P.B. on the operator interface alarms' page.

4.5.3.ALARM: WATER LEAKAGE OF P1 / P2 / P3 / P4 PUMP

The faults detection will be done by the sensors attached to Mini CAS II units of ITT Flygt. The interface relay of this unit (**R6, R8, R10, R12**) operates if water is detected in the corresponding pump (P1, P2, P3, P4). The contact of this relay is connected to PLC input to provide the information.

If one of these contacts is closed, the corresponding contactor closing signal will be removed (See R1, R2, R3, R4 relays) and the alarm LEAKAGE will be memorized in PLC & operator interface memories.

This alarm will be held, even if the fault conditions disappear. The contactor of the pump in fault will open automatically and cannot be closed without an operator's intervention.

Reset the circuit after the fault correction: push the RESET push-button (Alarm Page) once for **acknowledge**, and twice for **reset**.

4.5.4. ALARM: HIGH TEMPERATURE OF P1 / P2 / P3 / P4 PUMP

The faults detection will be done by the sensors attached to Mini CAS II units of Flygt. The interface relay of this unit (**R5, R7, R9 or R11**) operates if a temperature of pump goes higher than sensor adjustment in the corresponding pump. The contact of this relay is connected to PLC input to supply the information.

If one of these contacts is closed, the corresponding contactor closing signal will be removed (see R1, R2, R3, R4 relay) and the alarm HIGH TEMPERATURE will be memorized in PLC & operator interface memories.

This alarm will be held, even if the fault conditions disappear. The contactor of the pump in fault will open automatically and cannot be closed without an operator intervention.

Reset the circuit after the fault correction by pushing MiniCAS RESET first and then push the RESET push-button once for **acknowledge** and twice for **reset**, or use RST P.B. on the operator interface alarms' page.

4.5.5. ALARM: HIGH LEVEL

The fault detection will be done by FLH float. The normally open contact (NO) of the ISRH interface relay is connected to the PLC input.

If this contact is closed, a HIGH LEVEL alarm will be memorized in PLC (output **Q7**) & operator interface memories.

The R14 relay will operate (its NO contact is available for transmission of **ALARM** signal remotely).

This alarm will be held, even if the fault conditions disappear.

Reset the circuit after the fault correction: push the RESET push-button once for **acknowledge** and twice for **reset**, or use RST P.B. on the operator interface alarms' page.

4.5.6. ALARM: LOW WATER LEVEL

The faults detection will be done by FLL float. The normally open contact (NO) of ISRL interface relay is connected to the PLC input.

If this contact is closed, a LOW LEVEL alarm will be memorized in PLC (output **Q8**) & operator interface memories.

This alarm will be held, even if the fault conditions disappear.

The R14 relay will operate (its NO contact is available for transmission of **ALARM** signal remotely)

Reset the circuit after the fault correction: push the RESET push-button once for **acknowledge** and twice for **reset**, or use RST P.B. on the operator interface alarms' page.

4.5.7. ALARM: POWER FAILURE

The faults detection will be done by the power failure detector (PFD) connected to three phases of the power entrance. The PFD operates on phase or power failure. Its NC contact is opened if three phases are present and voltage value is between adjusted limits. On fault this contact will close.

If this contact is closed, the contactor closing signals will be removed (see R1, R2, R3, R4 relay) and the alarm POWER FAILURE will be memorized in PLC & operator interface memories.

This alarm is maintained if fault conditions disappear but the pumps can start if the power is back to normal

Reset the circuit after the fault correction: push the RESET push-button once for **acknowledge** and twice for **reset**, or use RST P.B. on the operator interface alarms' page.

4.5.8. ALARM: P1 / P2 / P3 / P4 PUMP LOW CURRENT

If the pump current analog inputs are used these alarms can be available. The limit values for these alarms can be provided by an operator using the operator interface (see chapter 5.2 for details). The default values are established as zero (0) Amps. The 30-second delay (by default) prevents the activation of the alarm during transient conditions. An operator can change these values for the LOWEST POSSIBLE CURRENT established during pump's running test.

If current value is lower than established lowest value for respective pump, the PUMP LOW CURRENT alarm will be registered in PLC & operator interface memories

This alarm will be held, even if the fault conditions disappear. The contactor of the pump in fault will open automatically and cannot be closed without an operator's intervention.

Reset the circuit after the fault correction: push the RESET push-button once for **acknowledge** and twice for **reset**, or use RST P.B. on the operator interface alarms' page.

4.5.9. ALARM: P1 / P2 / P3 / P4 PUMP HIGH CURRENT

If pump current analog inputs are used these alarms can be available. The limit values for these alarms can be provided by an operator using the operator interface (see chapter 5.2 for details). The default values are established on 35 Amps. An operator can change these values for the HIGHEST POSSIBLE CURRENT established during pump's running test.

If current value is higher than established highest value for respective pump, the PUMP HIGH CURRENT alarm will be registered PLC & operator interface memories.

The 30-second delay (by default) prevents the activation of the alarm during transient conditions.

This alarm will be held, even if fault conditions disappear. The contactor of the pump in fault will open automatically and cannot be closed without an operator's intervention.

Reset the circuit after the fault correction: push the RESET push-button once for **acknowledge** and twice for **reset**, or use RST P.B. on the operator interface alarms' page.

4.5.10. ALARM Output: P1 / P2 / P3 / P4 PUMP Failure

The following alarms activate the corresponding output Q9, Q10, Q11, Q12 as corresponding pump failure P1, P2, P3, and P4:

- Overload
- Contactor closing fault
- Leakage
- High Temperature

- Low /High current

4.5.11. Alarm Output (Q4): COMMON ALARM

All alarms described above will activate the COMMON ALARM OUTPUT with **R14** interface relay. The contacts of this relay are available to remote control or indication. If all active alarms are acknowledged, the common alarm output is de-activated

4.5.12. Alarm Output (Q1): PLC failure

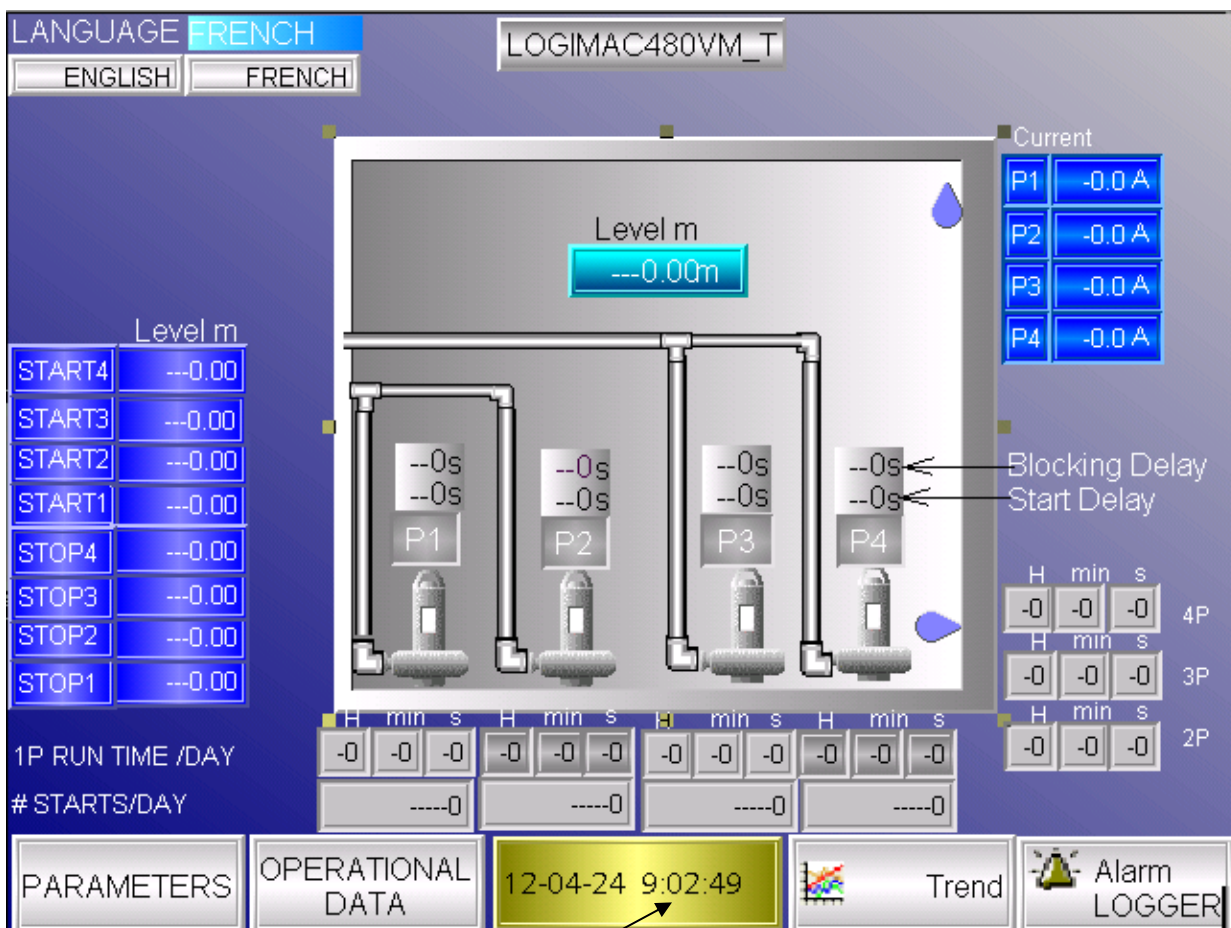
If PLC is functioning correctly the output Q1 is activated. In case of internal PLC fault or external PLC supply fault the output Q1 will be not energized. Use the normally closed contact of the interposing relay R15 attached to this output for alarm transmission.

5. OPERATOR INTERFACE PROGRAM DESCRIPTION

Using the operator interface, an operator can :

- read or change PLC current date & time
- read the parameters and data stored in the PLC data registers
- write/change the system operating parameters (password protected)
- read the alarm register in order of the occurrence
- monitor the alarms
- see historic values: TRENDS
- reset all parameters to their default values (cold start)

5.1 MAIN SCREEN



To change the **date or time** touch the digital clock

The keyboard will appear to allow you to write /correct the date and time if needed

The screenshot shows the touch screen interface of the Logimac 480VM_T. At the top, there are buttons for 'LANGUAGE' (FRENCH, ENGLISH, FRENCH) and 'LOGIMAC280VM'. Below these, there are fields for 'Volume/Day' (0) and 'Volume Tot' (0 m3). The main display area shows the date and time '12-01-04 9:48:46'. Below this is a virtual keyboard with the following layout:

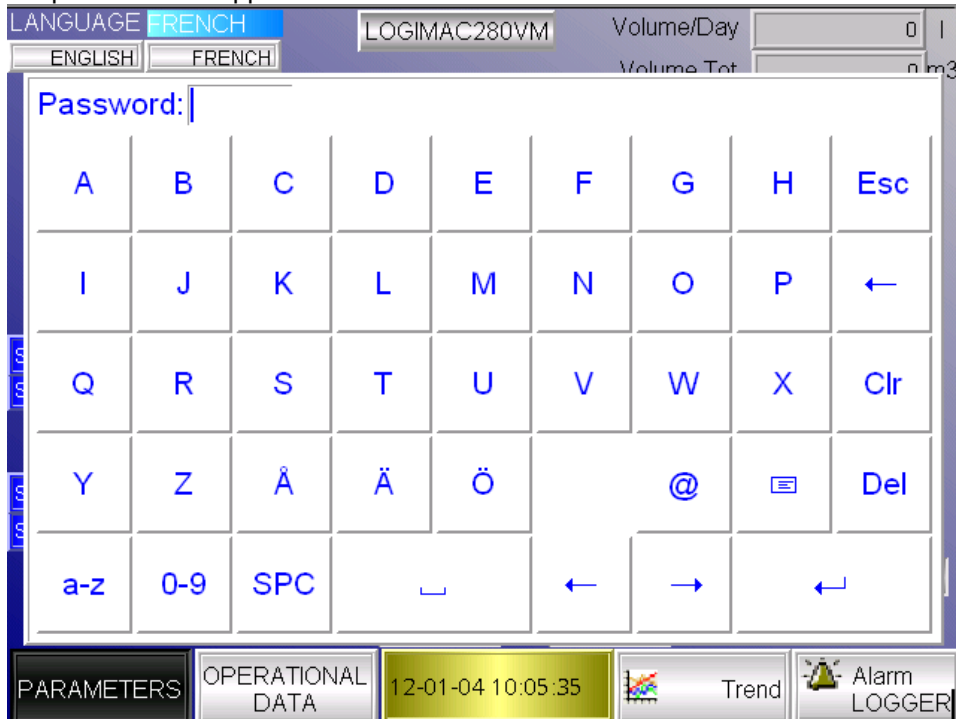
<	>	:	;	#	7	8	9	Esc
(	)	,	'	°	4	5	6	←
[	]	&	?	!	1	2	3	Clr
%	=	*	/	+	-	0	.	Del
A-Z	a-z	SPC	␣	←	→	↶		

At the bottom of the screen, there are buttons for 'PARAMETERS', 'OPERATIONAL DATA', '12-01-04 9:48:46', 'Trend', and 'Alarm LOGGER'.

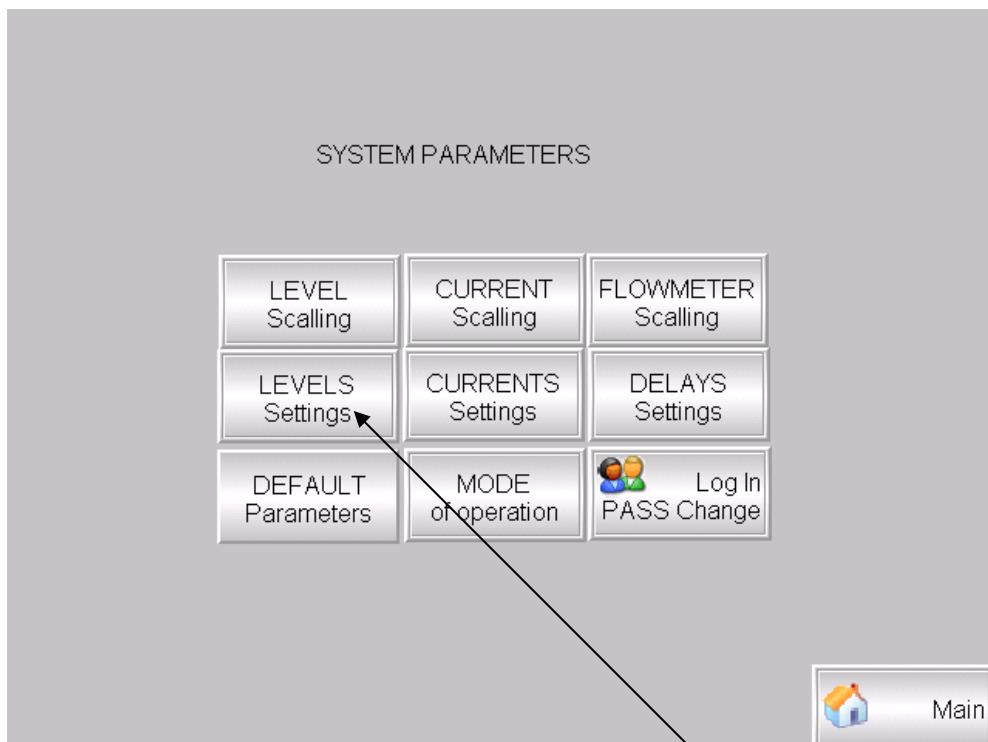
Correct the date and time keeping the same format: **yy-mm-dd hh:mm:ss** for 24hours system

5.2. PARAMETERS' SCREENS

Some operational parameters are shown on the main screen. They are read only values. To change them, touch PARAMETERS. This action is protected by PASSWORD so the keyboard to write the password will appear.



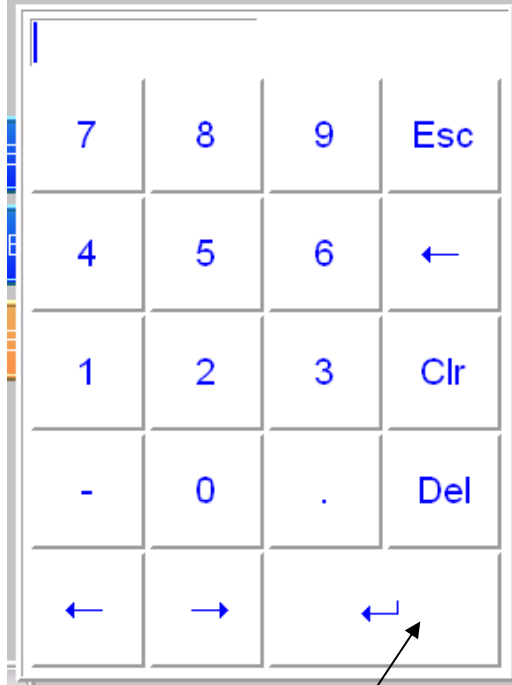
Write password (default is 9), and touch  and the screen of the parameter group will appear:



Choose the group of parameters you want to see or change and the corresponding screen will appear

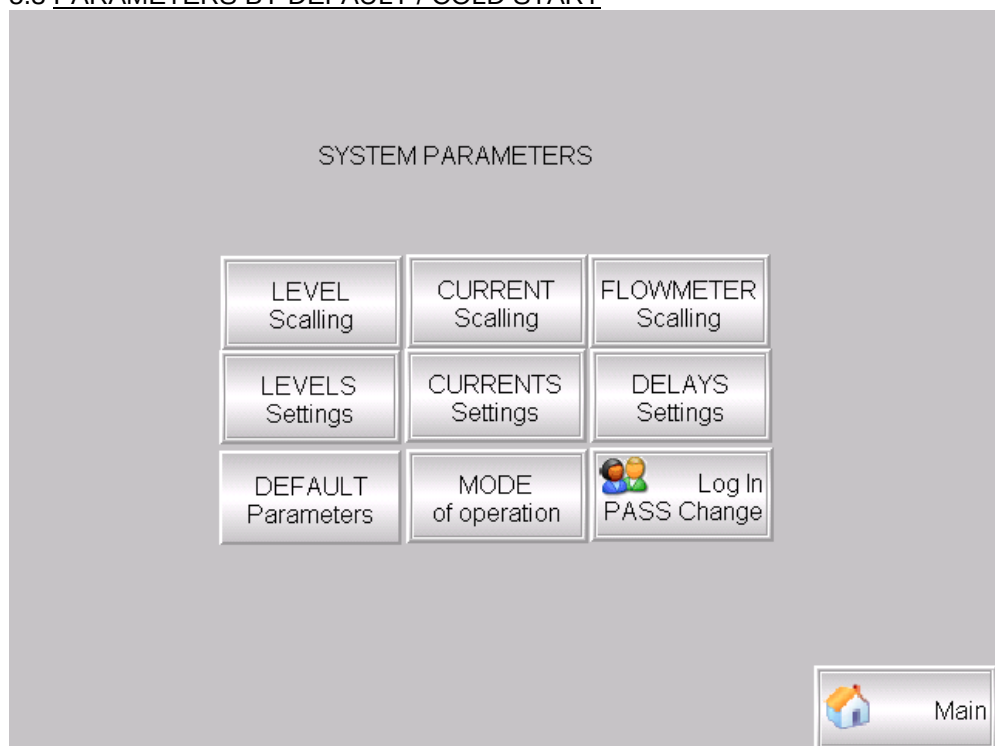


Touch the value you want to change. The keyboard will appear:

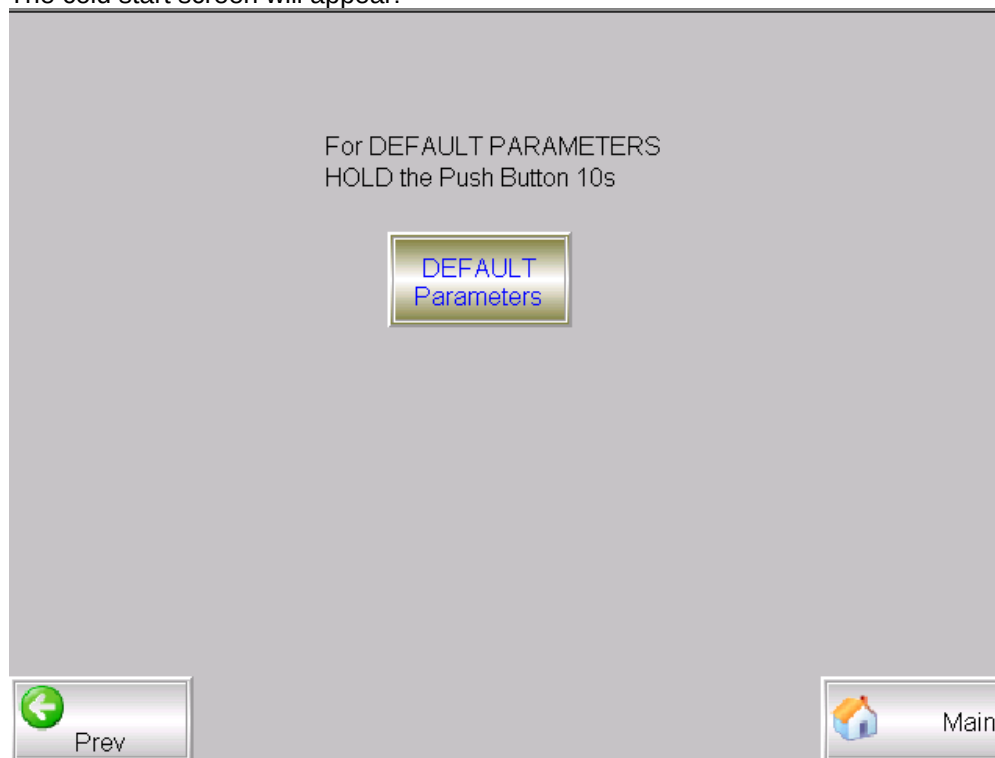


Write the value and touch
Proceed with other parameter or parameters' group

5.3 PARAMETERS BY DEFAULT / COLD START



Touch DEFAULT Parameters to go back to the all initial setting (as per table on page 10 - Cold Start)
The cold start screen will appear:



Touch and hold 10 seconds the DEFAULT Parameters touch button

The parameters will change as per table below

FUNCTION KEY 1	FUNCTION KEY 2	PLC REGISTER	PARAMETER	INITIAL VALUE	NOTES
Main Screen	-	225	Language F - French E - English	E - English	
PARAMETERS	PASS change	102	New password	9	
PARAMETERS	DELAYS Settings	2	Start 1 delay	10 s	
PARAMETERS	DELAYS Settings	5	Start 2 delay	10 s	
PARAMETERS	DELAYS Settings	613	Start 3 delay	10 s	
PARAMETERS	DELAYS Settings	616	Start 4 delay	10 s	
PARAMETERS	DELAYS Settings	8	Blocking delay P1	15 s	
PARAMETERS	DELAYS Settings	11	Blocking delay P2	15 s	
PARAMETERS	DELAYS Settings	619	Blocking delay P3	15 s	
PARAMETERS	DELAYS Settings	622	Blocking delay P4	15 s	
PARAMETERS	DELAYS Settings	20	Alarm delay	5s	
PARAMETERS	DELAYS Settings	132	Contactor Closing delay	10s	
PARAMETERS	LEVEL Scaling	70	minimum level for 4 mA	0 m	
PARAMETERS	LEVEL Scaling	72	maximum level for 20mA	3.20 m	
PARAMETERS	LEVELS Setting	74	Start 1 level	1.00 m	
PARAMETERS	LEVELS Setting	75	Start 2 level	1.20 m	
PARAMETERS	LEVELS Setting	625	Start 3 level	1.40 m	
PARAMETERS	LEVELS Setting	626	Start 4 level	1.60 m	
PARAMETERS	LEVELS Setting	76	Stop 1 level	0.50 m	
PARAMETERS	LEVELS Setting	77	Stop 2 level	0.50 m	
PARAMETERS	LEVELS Setting	627	Stop 3 level	0.50 m	
PARAMETERS	LEVELS Setting	628	Stop 4 level	0.50 m	
PARAMETERS	LEVELS Setting	107	High level alarm	2.00 m	
		106	Low level alarm	0 m	
PARAMETERS	CURRENT Scaling	96	P1 max. current	50 A	
PARAMETERS	CURRENT Scaling	98	P2 max. current	50 A	
PARAMETERS	CURRENT Scaling	629	P3 max. current	50 A	
PARAMETERS	CURRENT Scaling	631	P4 max. current	50 A	
PARAMETERS	CURRENTS Settings	111	P1 high current alarm	35 A	
		701	Delay	30 s	
PARAMETERS	CURRENTS Settings	112	P2 high current alarm	35 A	
		704	Delay	30 s	
PARAMETERS	CURRENTS Settings	633	P3 high current alarm	35 A	
		713	Delay	30 s	
PARAMETERS	CURRENTS Settings	634	P4 high current alarm	35 A	
		716	Delay	30 s	
PARAMETERS	CURRENTS Settings	100	P1 low current alarm	0 A	
		707	Delay	30 s	
PARAMETERS	CURRENTS Settings	101	P2 low current alarm	0 A	
		710	Delay	30 s	
PARAMETERS	CURRENTS Settings	635	P3 low current alarm	0 A	
		719	Delay	30 s	
PARAMETERS	CURRENTS Settings	636	P4 low current alarm	0 A	
		722	Delay	30 s	
PARAMETERS	Mode of operation	23 24 2000 2001 2002 1803	Number of pump in OPERATION: in PARALLEL: Number of pumps: Jockey Normal Storm Standby pump choice !!All pumps have to be Normal!!	4 4 0 4 0 Alternate all	Choice: 1..4 2..4 0..1 2..4 0..1 Alternate all Alternate, P3SB Alternate, P4SB * Alternate, P2SB

		1800	Lead pump choice		Alternate, P1SB No ALT, P1Lead No ALT, P2Lead No ALT, P3Lead No ALT, P4Lead*
--	--	------	------------------	--	--

5.4 OPERATIONAL DATA Screen

On Main Screen touch OPERATIONAL DATA to go to the screen as below

	PUMP P1			PUMP P2			PUMP P3			PUMP P4		
	H	min	s	H	min	s	H	min	s	H	min	s
1P RUN TIME /DAY	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0	-0
1P RUN TIME TOTAL	----	-0	-0	----	-0	-0	----	-0	-0	----	-0	-0
Number of STARTS/DAY	----			----			----			----		
Number of STARTS Tot.	----			----			----			----		

	2 PUMPS			3 PUMPS			4PUMPS		
	H	min	s	H	min	s	H	min	s
RUN TIME /DAY	-0	-0	-0	-0	-0	-0	-0	-0	-0
RUN TIME TOTAL	----	-0	-0	----	-0	-0	----	-0	-0

Number of HIGH level	----	Number of OVERFLOW	----
----------------------	------	--------------------	------

Time of OVERFLOW	----	-0	-0
------------------	------	----	----


Main

The data on this screen are READ ONLY. This data can be reset only by authorized person. Level 2 passwords is required.

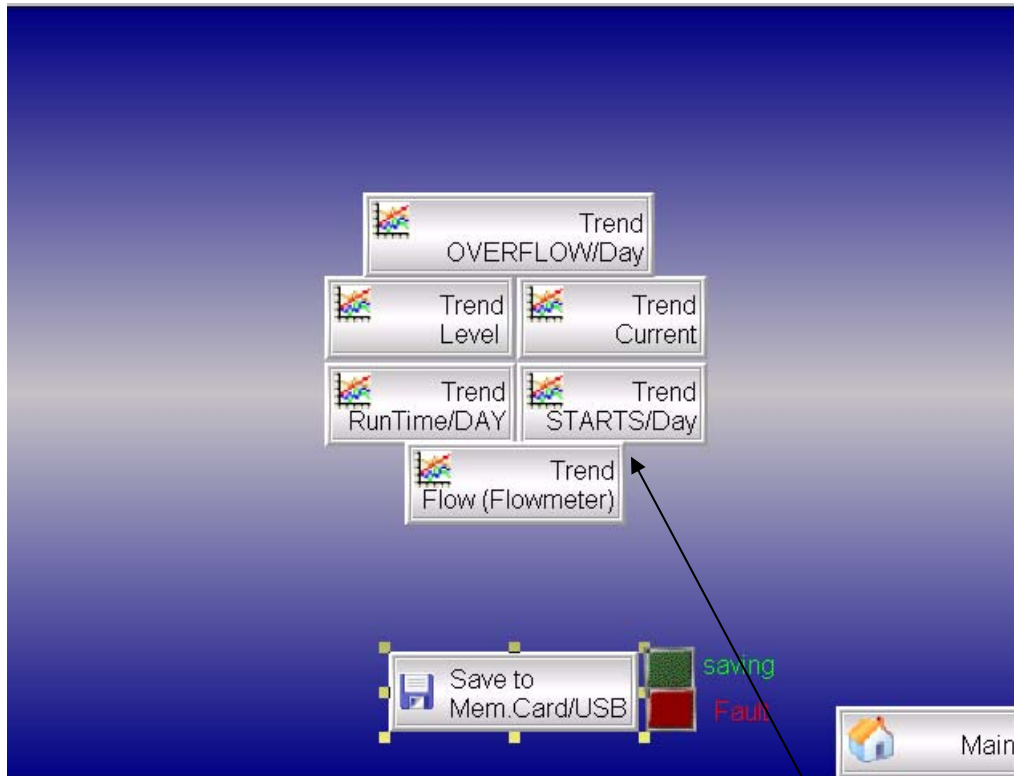
Parameters to read are given in the table 5 below:

TABLE 5. PLC DATA REGISTER READING

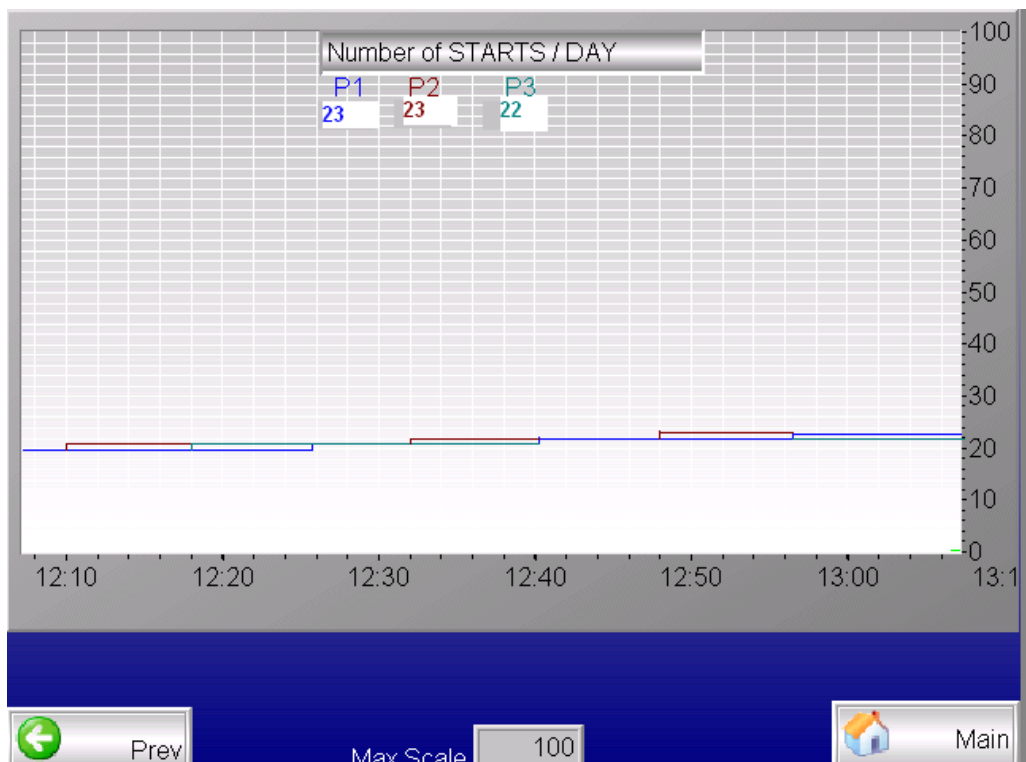
FUNCTION KEY of OPERATOR INTERFACE	PLC REGISTER	PARAMETER
Operational Data	146, 143, 140	Runtime P1 total
Operational Data	176, 173, 170	Runtime P1/day
Operational Data	155, 152, 149	Runtime P2 total
Operational Data	185, 182, 179	Runtime P2/day
Operational Data	542, 539, 536	Runtime P3 total
Operational Data	578, 575, 572	Runtime P3/day
Operational Data	551, 548, 545	Runtime P4 total
Operational Data	587, 584, 581	Runtime P4/day
Operational Data	164, 161, 158	2P Runtime total
Operational Data	194, 191, 188	2P Runtime/day
Operational Data	560, 557, 554	3P Runtime total
Operational Data	596, 593, 590	3P Runtime/day
Operational Data	569, 566, 563	4P Runtime total
Operational Data	605, 602, 599	4P Runtime/day
Operational Data	217, 214, 211	Overflow runtime
Operational Data	202	No. of starts P1
Operational Data	205	No. of starts P2
Operational Data	608	No. of starts P3
Operational Data	645	No. of starts P4
Operational Data	208	Hi level occurrences
Operational Data	220	Overflow occurrences

5.4 TRENDS' Screen

Touch the TRENDS button on the main screen to see the TRENDS' screen

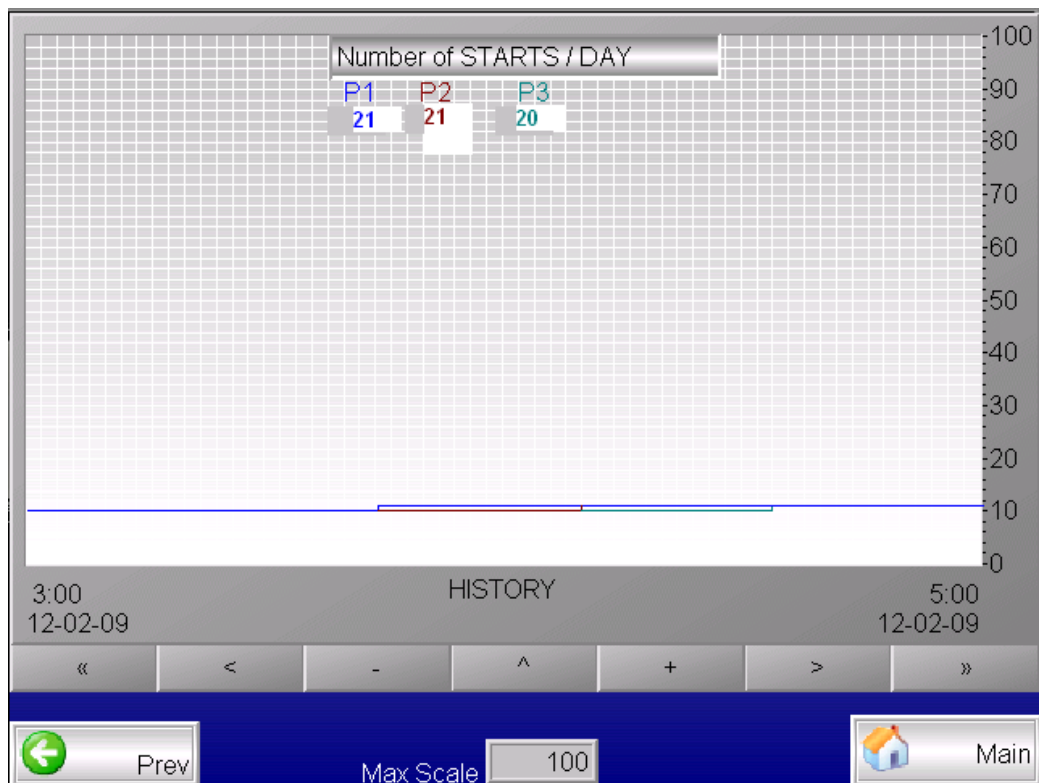


Choose one of the trends by touching the corresponding button



You can adjust the scale for more precision view

Touch at the bottom of the trend to view historic data



Use the arrow buttons <> or <<>> to go backward or forwards. Use + or – to change the time scale
Use ^ to go back to normal view.

All historic trends data are stored in operator interface memory as files with suffix **.SKV**

These files can be loaded to personal computer using the Ethernet connection. Use the cross Ethernet standard cable. Operator interface IP address is shown on power up of the unit (default is **192.168.1.1**)
On Internet Explorer page write: [ftp://192.168.1.1](http://192.168.1.1) or just 192.168.1.1 to communicate with operator interface and see the trends files. The files **.SKV** are compatible with MS EXCEL.

The format of the trend is as follow:

DDDD;TTTT;AAAA;BBBB;CCCC;DDDD;EEEE;FFFF

Where

DDDD- date in format yy-mm-dd

TTTT - time in format hh:mm:ss

AAAA –curve 1 data (sample: P1 starts number)

BBBB - curve 2 data (sample: P2 starts number)

CCCC – curve 3

DDDD – curve 4

EEEE – curve 5

FFFF – curve 6

The **alarm** file is also stored in the operator interface as **.SKV** file.

The file format is:

DDDD;TTTT;DDDD;TTTT;DDDD;TTTT;FFFFFFFFFFFF Where:

DDDD- date of alarm's activation yy-mm-dd

TTTT- time of alarm's activation hh:mm:ss

DDDD- date of alarm's deactivation yy-mm-dd

TTTT- time of alarm's deactivation hh:mm:ss

DDDD- date of alarm's acknowledging yy-mm-dd

TTTT- time of alarm's acknowledging hh:mm:ss

FFFFFFFFFFFF- alarm description

EXTERNAL MEMORY CARD :

If memory card is inserted into operator interface the trends files can be transferred into for farther handling using the touch key SAVE TO MEM.CARD/USB.

!!! Do not TOUCH this key if the memory card is not inserted !!! It will lock the interface

The type of card recommended is [KC64MF-201](#) from [Cactus Industrial](#) or [SQF-P10S1-1G-P8C](#) from [Advantech](#)

!!! You have to remove the operator interface supply before installing and removing the card!!!

Usage of USB key is recommended instead of memory card.

USB operation (inserting and removing) does not require the power removing from interface.

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Pointe-Claire, QC, Tel.: (514)695-0133 • Saint-Augustin-de-Desaures, QC, Tel.: (418)878-1800
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